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Projects

My main effort is researching/developing/promoting feature rich image compression as embodied in [JPEG 2000](#) . I've been working on the JPEG 2000 Interactive Protocol (JPEG 2000 Part 9). I've finished editing the standard for conformance to JPEG 2000 (Part 4).

Research Interests

All aspects of compression: entropy coding, probability estimation, context modeling, quantization, transformation, color transformations and sampling, syntax, and application features.

Image processing especially for scanners, printers, and digital cameras, including halftoning, resampling, segmentation, and enhancement.

Education

PhD Electrical Engineering, [Stanford University](#) , 1994

Dissertation:

[Source Coding with Channel, Distortion, and Complexity Constraints](#)

MS Electrical Engineering, [Stanford University](#) , 1991

BS Electrical Engineering, [University of Kansas](#) , 1989

BS Mathematics, [University of Kansas](#) , 1989

Selected Publications

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research or instruction, provided that you agree to respect these copyrights.

Michael Gormish and Bernard Brower, "JPEG 2000 part 4: how to test a scalable compression system," *Proceedings of the SPIE*, Vol. 5203, San Diego, November 2003.

Michael J. Gormish and Serene Banerjee, "Tile-based transport of JPEG 2000 images," *VLVB03*, Madrid, Spain, September 2003.

"Icon based error concealment for JPEG and JPEG 2000 Images," *Int. Conf. on Image Processing*, Barcelona, Spain, September 2003.

"JPEG 2000 Images as you like" invited presentation given at University of Kansas, Purdue, and University of Texas at Austin 2001.

Kathrin Berkner, Michael J. Gormish, and Edward L. Schwartz "Multiscale Sharpening and Smoothing in Besov Spaces with Applications to Image Enhancement," *Applied and Computational Harmonic Analysis* 11, 2-31 (2001). <http://www.idealibrary.com>

Michael J. Gormish, Daniel Lee, Michael W. Marcellin, "JPEG 2000: Overview, Architecture, and Applications," *Int. Conf. on Image Processing*, Vancouver, Canada, September 2000.

Maya Gupta, Michael Gormish, and David G. Stork, "Block color quantization: a new method for color halftoning," *Int. Conf. on Image Processing*, Vancouver, Canada, September 2000.

Kathrin Berkner, Michael J. Gormish, Edward L. Schwartz, and Martin Boliek, "A new wavlet-based approach to sharpening and smooting of images in Besov spaces with applications to deblurring," *Int. Conf. on Image Processing*, Vancouver, Canada, September 2000.

M. Gormish, M. Marcellin, " The JPEG2000 Standard ," (invited midday presentation), Data Compression Conference 2000.

M. Marcellin, M. Gormish, A. Bilgin, M. Boliek, " An Overview of JPEG-2000 ," *Proc. Data Compression Conference*, J. A. Storer and M. Cohn, eds., Snowbird, Utah, Mar. 28-Mar. 30, 2000, p. 523-541.

"JPEG 2000: Worth the Wait?" (invited) 42nd Midwest Symposium on Circuits and Systems, August 1999, Las Cruces, NM.

M. J. Gormish, N. Matsuura, and T. Yagashita, " An adaptive transform for compression of mixed con-tone and graphics ," *Picture Coding Symposium*, Portland, Oregon, May 1999.

Edward L. Schwartz, Kathrin Berkner, and Michael J. Gormish, " Optimal tile boundary artifact removal with CREW ," *Picture Coding Symposium*, Portland, Oregon, May 1999.

M. Boliek, M. Gormish, E. L. Schwartz, and A. F. Keith, "Decoding compression with reversible embedded wavelets (CREW) codestreams," *Journal of Electronic Imaging*, Vol. 7. No. 3, pp. 402-209, July 1998.

Martin Boliek, Michael J. Gormish, Edward L. Schwartz, Alexander Keith, " Next Generation Image Compression and Manipulation Using CREW," *Int. Conf. on Image Processing, 1997*, Santa Barbara, CA, October 1997.

"Feature Rich Still Image Compression: CREW and JPEG 2000" (invited talk) Workshop on High Fidelity Media Processing, USC's Integrated Media Systems Center, February 14, 1997.

Michael J. Gormish, Edward L. Schwartz, Alexander Keith, Martin Boliek, and Ahmad Zandi, "Lossless and Nearly Lossless Compression for High Quality Images," *Proceedings SPIE, Very High Resolution and Quality Imaging II*, Vol. 3025, pp. 62-70, San Jose, CA, February 1997.

Michael J. Gormish, John T. Gill, "Discrete Minimum Entropy Quantization," *IEEE Trans. Image Processing*, Vol. 4, No. 9, September 1995, pp. 1314-1317.

"Compression of Palletized Images by Color," *Int. Conf. on Image Processing*, Washington D.C., 1995.

Martin Boliek, James D. Allen, Edward L. Schwartz, Michael J. Gormish, "Very High Speed Entropy Coding," *IEEE International Conference on Image Processing*, Vol. 3, Austin, TX, November 1994, pp. 625-629.

Michael Gormish, James D. Allen, "Finite State Machine Binary Entropy Coding" (pdf of full paper, abstract in) *Proc. Data Compression Conference*, J. A. Storer and M. Cohn, eds., Snowbird, Utah, Mar. 30-Apr. 1, 1993, p. 449.

Michael J. Gormish, John T. Gill, "Computation-rate-distortion in transform coders for image compression," *Proc. SPIE*, San Jose, CA, 1993.

Paul R. Teich, Michael J. Gormish, "A JPEG performance analysis utilizing a generalized Chen transform on the Am29050 microprocessor," *RISC '92*, San Jose, CA, February 1992.

Adolph Smith, Michael J. Gormish, Martin Boliek, "Physics and image data compression," *SPIE Image Processing Algorithms and Techniques III*, Vol. 1657, San Jose, CA, February 1992, pp. 153-158.

Professional Service

Session Chair and Organizer, "Special Session on JPEG 2000," *ICIP 2000*, Vancouver, Canada.

Reviewer for:

ICIP (International Conference on Image Processing)
IEEE Signal Processing Letters
IEEE Transactions on Signal Processing
IEEE Transactions on Image Processing
IEEE Transactions on Communications
IEEE Pattern Analysis and Machine Intelligence
IEEE Circuits and Systems for Video Technology
Pattern Recognition Letters
Kluwer Academic Publishers
Data Compression Conference

Issued US Patents

6,298,358 Method and apparatus for removing blank space from a document to be displayed
6,285,790 Data compression for indexed color image data (strangely the patent office dropped my name on this just before publication, but in some databases it is back)
6,195,465 Method and apparatus for compression using reversible wavelet transforms and an embedded codestream
6,141,446 Compression and decompression system with reversible wavelets and lossy reconstruction
6,094,151 Apparatus and method for finite state machine coding of information selecting most probable state subintervals
6,073,118 Method for performing secure financial transactions using facsimile transmissions
6,043,802 Resolution reduction technique for displaying documents on a monitor
5,966,465 Compression/decompression using reversible embedded wavelets
5,912,636 Apparatus and method for performing m-ary finite state machine entropy coding
5,910,796 Monitor gamma determination and correction
5,881,176 Compression and decompression with wavelet style and binary style including quantization by device-dependent parser
5,867,602 Reversible wavelet transform and embedded codestream manipulation
5,717,394 Method and apparatus for encoding and decoding data
5,710,562 Method and apparatus for compressing arbitrary data
5,692,048 Method and apparatus for sending secure facsimile transmissions and certified facsimile transmissions
5,689,589 Data compression for palettized video images
5,675,645 Method and apparatus for securing executable programs against copying
5,659,631 Data compression for indexed color image data
5,583,500 Method and apparatus for parallel encoding and decoding of data
5,475,388 Method and apparatus for using finite state machines to perform channel modulation and error correction and entropy coding
5,430,480 Sensor driven global motion compensation
5,337,362 Method and apparatus for placing data onto plain paper